

Software Change Report, Download and BD32

1	Software Change Report for Evita 4	2
1.1	An Overview of Software Versions, Approval and Regions	2
1.2	Description of Software Changes for Evita 4.....	4
2	Software Change Report for Evita 2 dura	12
2.1	An Overview of Software Versions, Approval and Regions	12
2.2	Description of Software Changes for Evita 2 dura	13
3	Download	19
3.1	Test equipment.....	19
3.2	Download description	20
4	Loading the Software via BD32	24
4.1	Test Equipment for BD32	24
4.2	Installing and Using BD32	25
4.3	Loading the Software to the Graphics Controller PCB/ Frontpanel PCB	27
4.4	Loading the Software to the Pneumatics Controller PCB	29
4.5	Loading the Software to the CPU 68332 PCB	31
4.6	Downloading Software to Communication PCB.....	33

Software Change Report, Download and BD32

1 Software Change Report for Evita 4

1.1 An Overview of Software Versions, Approval and Regions

The following table provides an overview of approved software versions for different regions.

invalid: This software version is approved, but should not be used because it no longer reflects the latest version. An updated version should be installed when the next repair work or inspection takes place.

current: This software is both approved and the most current version.

approved: This software is approved but not a current version. Conversion is only necessary if improvements are desired.

not approved: This software version is not approved in a country or region and is, thus, NOT to be used.

Software versions ¹⁾	All Regions except the USA and Japan	USA only	Japan only	Order No. of Conversion Kit ³⁾
1.00 to 1.03 ²⁾	invalid	invalid	invalid	-
1.04 ²⁾	approved	approved	invalid	-
2.00 ²⁾	test only, invalid	not approved	not approved	-
1.05 ²⁾	not approved	not approved	approved	-
2.11 ²⁾	approved	not approved	not approved	-
1.06 ²⁾	not approved	not approved	approved	-
2.20	approved	not approved	not approved	-
1.07	not approved	not approved	approved	-
1.08	not approved	approved	not approved	-
1.09	not approved	not approved	approved	-
2.21	approved	approved	not approved	-
1.10	not approved	not approved	approved	-
2.22	approved	approved	not approved	-
1.11	not approved	not approved	current as of 08/98	8413471
2.23	approved	approved	not approved	-
3.10	not approved	not approved	not approved	8414292
3.21	approved	approved	approved	8414589

Software versions ¹⁾	All Regions except the USA and Japan	USA only	Japan only	Order No. of Conversion Kit ³⁾
3.22	approved	approved	approved	8414490
4.0	current as of 01/2001	current as of 01/2001	not approved	8414467

- 1) Software Versions: are sorted according to publication dates. The Instructions for Use/Operating Instructions vary for Software Versions 1.n, 2.n, and 3.n. Keypad strips are the same for Software Versions 1.n and 2.n. New keypad strips are required for Software Version 3.n and higher, e.g. because of the new button "Exp. Hold" (see note 3).
- 2) Important: If the display Toshiba LTM C209A is added during repair work, it is imperative that the software be changed to include Software Version 1.07, 1.08, 2.20 or a higher version! This display will be used for the spare-parts conversion kit display and in all units beginning in October 1997.
- 3) 2) Software conversion kit software: This kit contains everything necessary for updating and upgrading a unit's software: Download disk, options indicator stickers, Instructions for Use and, if required, keypad strips or other parts. After DrägerService has carried out the conversion, the download disk should be kept for future repair cases. As of Service Software Version 8.n, it will be possible to archive several download programs on service PCs.

1.2 Description of Software Changes for Evita 4

Software version	Changes
1.00	Initial version Instructions for Use for software version 1.n
1.01	Based on software version 1.00 Instructions for Use for software version 1.n Improvements to software version 1.00: <ul style="list-style-type: none"> – Avoids faulty CO₂ measurement values – Avoids unit failure 02.71.018 (wrong nebulizer gas) – Avoids control unit failure and control unit restart after power-on. – Avoids faulty display characters, restarts and unit failure 02.02.003. – Avoids incorrect MV allocation when the ramp steepness is 0.0 s. – See also Service Bulletins Nos. 2 and 5.
1.02	Based on software version 1.01 Instructions for Use for software version 1.n Improvements to software version 1.01: <ul style="list-style-type: none"> – The printer log in Spanish has been corrected. – Avoids loss of data in serial EEPROM on the CPU 68332 PCB – See also Service Bulletins Nos. 2 and 8.
1.03	Based on software version 1.02 Instructions for Use for software version 1.n Improvements to software version 1.02: <ul style="list-style-type: none"> – Avoids the error message "key overused". – Refresh timing for video RAMs were changed on the Graphics Controller PCB because, as of 7/96, new RAMs were used in production.
1.04	Based on software version 1.03 Instructions for Use for software version 1.n Improvements to software version 1.03: <ul style="list-style-type: none"> – Unit check, leak test with larger tolerance for leakage (0.3 L/min; previously 0.2 L/min). – Warning alarm monitoring helps avoid unit failure 02.71.010 (alarm current too low). – Standby activation and deactivation – Unit failure 05.05.006 during unit check omitted. – See also Service Bulletins Nos. 2 and 10.

Software version	Changes
2.00	<p>Test software, based on software version 1.04 Instructions for Use for software version 2.n</p> <p>Improvements to software version 1.04:</p> <ul style="list-style-type: none"> – Internal service mode for all PCBs (previously only for pneumatics and error lists). – External service mode implemented via PC. – Unit failure 14.10.001 with 4 % tolerance (previously 1 %). – There are several new service codes with lead-in codes. – Leakage monitoring and compensation: Evita compares the applied inspiratory MV with the measured expiratory MV, balances the leakage and displays it as "MVLeak". The "MVLeak" value automatically corrects the applied Vti as well as the expiratory measured flow values Flow and Vte. For safety reasons, the measured minute volume values are not corrected. – Compliance compensation: The hose system compliance is measured during the unit check leak test. This value allows for an automatic correction of volume-controlled mechanical breaths as well as the measured values of the flow monitor. – Apnea ventilation with SIMV pattern – The Pmax setting is displayed on the PAW pressure curve as a dotted line. – The following pressure-ventilation parameters are displayed on the pressure curve as dotted lines during adjustment: PEEP, P_{insp} with BIPAP, PASB, P_{high} and P_{low} with APRV. – Loop display also for a single mechanical breath, e.g. during "mixed" ventilation modes such as SIMV. – A daily, automatic calibration of O₂ monitoring and flow monitoring is synchronized with other activities (e.g. unit check) to avoid unnecessary messages. Calibration results are entered in the log.
2.00	<ul style="list-style-type: none"> – Japanese language available. – AutoFlow can be configured as a initial parameter. – A notice is displayed if all ventilation parameters need to be adjusted due to a change in patient type or patient weight. – The unit check leak test can be performed independent of other tests. Hose resistance and compliance are measured during this test. The leak test is carried out with 60 mbar (previously 30 mbar), the leakage is displayed with a max. permissible leak rate of 0.3 L/min (from the mixer) in order to keep the test pressure stable. – P_{insp} in BIPAP mode is not connected to PEEP. (P_{insp} used to be a relative value via PEEP; now it is an absolute value). – CO₂ measurement: V_{ds} calculation has been improved.

Software version	Changes
1.05	Based on software version 2.00 with identical functionality. Instructions for Use for software version 1.n This software version is only approved for use in Japan. Important: The NeoFlow option is not approved for use in Japan
2.11	Based on software version 2.00 Instructions for Use for software version 2.n Improvements to software version 2.00: <ul style="list-style-type: none"> – Trigger symbol: The patient symbol briefly changes to a lung symbol if the patient triggers a mandatory breath. – Flow curve: Spontaneous-breathing flow is displayed on the flow curve with a lighter color. – Flow is not delivered during "Inspiration Hold"; both the mixer and the expiratory valve are closed. – If AutoFlow and ASB are activated together, the lowest pressure applied through mandatory breaths will not be limited by the ASB pressure. (The ASB pressure can be higher than the AutoFlow mandatory breath). – No unit failure messages during the unit check. – The standby buzzer test on the CO2 Carrier PCB has been improved. – The expiratory valve resistance is compensated in relation to the flow. – NOdomo is controlled with the delivered flow in NTPD (previously BTPS). – See also Service Bulletins Nos. 15 and 16.
1.06	Based on software version 2.11 with identical functionality. Instructions for Use for software version 1.n This software version is only approved for use in Japan. Important: The NeoFlow option is not approved for use in Japan

Software version	Changes
2.20	<p>Based on software version 2.11 Instructions for Use for software version 2.n</p> <p>Improvements to software version 2.11:</p> <ul style="list-style-type: none"> – The "Alarm Silence" function immediately stops any audible alarms. – PPlat is only displayed if a real plateau appears during mandatory ventilation. – Allows an additional display "Toshiba LTM C209A". – Evita with DC module memorizes the charging state of the internal storage batteries. With storage batteries previously charged and within 24 hours, the unit starts with the message "Int. battery in use" instead of "Int. battery empty". – The hardware option "NeoFlow" is available. – The software option "Breathing Support Package" is available, and includes PPS mode and hose system compensation. This can be activated using a release number.
1.07	<p>Based on software version 2.20 with identical functionality. Instructions for Use for software version 1.n This software version is only approved for use in Japan. Important: The NeoFlow option is not approved for use in Japan</p>
1.08	<p>Based on software version 1.04 Instructions for Use for software version 1.n</p> <ul style="list-style-type: none"> – This software is only approved for the USA. <p>Improvements to software version 1.04:</p> <ul style="list-style-type: none"> – Allows an additional display "Toshiba LTM C209A". – CO₂ measurement: V_{ds} calculation has been improved. – PEEP-high alarm: High mandatory frequencies do not lead to PEEP-high alarm. – If pressure measurements are displayed in cmH₂O, the values for compliance and resistance are also related to cmH₂O. – If "Inspiration Hold" is pressed while in a pressure-controlled mode, flow is not delivered; the mixer and expiratory valve are closed. – NOdomo is controlled with the delivered flow in NTPD (previously BTPS).

Software version	Changes
2.21	<p>Based on software version 2.20 Instructions for Use for software version 2.n</p> <p>Improvements to software version 2.20:</p> <ul style="list-style-type: none"> – Unit check. During the leak test, the PEEP/PIP valve is set to 100 mbar (previously 60 mbar). Expiratory valves with minor crater damage now pass leak test as well. However, test pressure in tubing system remains 60 mbar. – Improved PEEP control for high-resistance tubing systems. – An absent or defective standard flow sensor does not result in auto-triggering. – An absent or defective standard flow sensor does not result in a higher PEEP. – There is no undesirable increase in PEEP pressure in Neo mode during nebulization. – Basic flow in Neo mode is deactivated when calibrating standard flow sensor. – Nebulization in Neo mode does not result in erroneous apnea message. – The airway pressure sensors are calibrated immediately after the self-test (previously after 3 minutes). – Error 02.71.001 no longer occurs between several aspiration modes if ventilation has not occurred in between. The 2-min aspiration time is too short for some users. – The "O2 measurement fault" alarm is suppressed for 1 minute after calibration of O2 measurement to enable hardware to attain a stable measurement status after calibration. Alarm was likely to occur after calibration if the voltage from the O2 sensor corresponded to an O2 concentration greater than 106 vol.%. This could happen if diaphragm Y3.3 is not centered. – The Gold-Cap test is performed every 20 hours (previously once an hour) to avoid the error message 02.71.003. – The flow and Tinsp settings are transferred correctly via Medibus, Lust and to the printer log (Tinsp to 2 decimal places). – Improvements to Dutch text "Enkele ademteng". – Text message handling in the lower blue text field has been improved. – Additional unit fault messages for HPSV Air and HPSV O2 11.01.001 to 11.01.015 = HPSV Air, the final digits correspond to the status message. 12.01.001 through 12.01.015 = HPSV O2, the final digits correspond to the status message.

Software version	Changes
2.21	<ul style="list-style-type: none"> – Improved starting behavior of Autoflow: If it is not possible to determine the necessary inspiratory pressure by applying a volume with minimum flow, a pressure of PEEP + 5 mbar is used in the first inspiratory stroke. During the next inspiration, a pressure corresponding to 75% of the calculated pressure is used. – Autoflow alarm situations resulting in termination of inspiration before volume is attained no longer cause an increase in the internal pressure set point. – The minimum sound volume setting has been increased. – Completion of an ASB breath is followed by the activation of a 500 ms (adult mode) or 150 ms (pediatric mode or Neo mode) trigger suppression time to prevent auto-triggering. – Error 02.71.018 is no longer displayed without cause. – NewFlow measurement improved due to "Neo flow sensor INOP". Neo flow measurement faults are suppressed in normal mode – Changing CO2 measurement units does not result in loss of data.
1.09	<p>Based on software version 2.21 with identical functionality. Instructions for Use for software version 1.n This software version is only approved for use in Japan. Important: The NeoFlow option is not approved for use in Japan.</p>
2.22	<p>Based on software version 2.21 Instructions for Use for software version 2.n</p> <p>Improvements to software version 2.21:</p> <ul style="list-style-type: none"> – There are several versions of expiratory valves with different expiratory resistances. The resistance is allowed for by the software.
1.10	<p>Based on software version 2.22 with identical functionality. Instructions for Use for software version 1.n This software version is only approved for use in Japan. Important: The NeoFlow option is not approved for use in Japan.</p>
2.23	<p>Based on software version 2.22 Instructions for Use for software version 2.n</p> <p>Improvements to software version 2.22:</p> <ul style="list-style-type: none"> – Calibration of exp. flow sensor in connection with suction mode has been implemented, – Apnea alarm in MMV mode occurs without delay. – Trigger times in MMV mode are the same as in SIMV mode. – Leakage compensation accuracy has been improved.

Software version	Changes
1.11	<p>Based on software version 2.23 with identical functionality. Instructions for Use for software version 1.n This software version is only approved for use in Japan. Important: The NeoFlow option is not approved for use in Japan.</p>
3.10	<p>Based on software version 2.23. Instructions for Use for software version 3.n</p> <p>Important: When updating from software versions 1.n/2.n to 3.n, a new keyboard insert strip and the instructions for use of software version 3.n are required. These items are included in the software version 3.10 upgrade kit.</p> <p>Improvements to software version 2.23:</p> <ul style="list-style-type: none"> – Additional languages: Portuguese, Russian, Arabic, Chinese, Greek. – New key "Night & Day" to dim the display via modified screen colors. – The "ATC tube compensation" software option can be activated independent of the PPS mode (this option will be available end of 1999). – Additional standard ILV mode (independent lung ventilation). – New "Exp. Hold" key to extend the expiratory phase time. During this phase, no flow is delivered and the expiratory valve is closed. – Nebulization of drugs possible in pediatric ventilation. – Oxygenation for bronchial suction in pediatric ventilation: Pre- and post-oxygenation is carried out with 25% rel. increased O₂ concentration. – The "Volume not constant" alarm can be accepted and suppressed by pressing the "Reset/Check" key. – Measurement maneuver PO.1 can be carried out in MMV mode. – Medibus protocol: PCO₂ curve corrected in mmHg. – Medibus protocol: Rounding error between displayed value and transmitted value corrected. – Automatic flow calibration in the nebulization phase if the measured MV is by 20% greater than the applied MV insp. This avoids the "Flow measurement fault" alarm. – The daily automatic flow calibration is performed only if the deviation between measured MV and applied MV insp. exceeds 10%. This increases the service life of the flow sensor. – During apnea ventilation, the following settings are entered in the log: f_{Apnea}, VT_{Apnea} or P_{Apnea}, PEEP and FiO₂.

Software version	Changes
3.21	<p>Based on software version 3.10. Instructions for Use for software version 3.n</p> <p>Improvements to software version 3.10:</p> <ul style="list-style-type: none"> – Removal of alarm deactivation after power-off while in standby mode. – Removal of malfunction during drug nebulization in pediatric and neonatal mode. – See also Service Bulletin no. 32.
3.22	<p>Based on software version 3.21 Instructions for Use for software version 3.n</p> <p>Improvements to software version 3.21:</p> <ul style="list-style-type: none"> – New CO2 carrier supported – HPSV valve actuation optimized
4.0	<p>Based on software version 3.22 Instructions for Use for software version 4.n</p> <p>Improvements to software version 3.22:</p> <ul style="list-style-type: none"> – Selection of previous patient settings (including alarm limits) when switching the unit on again. (Trends are not kept) – Leakage compensation can be deactivated. – Humidifier options: active / HME (Heat and Moisture Exchanger) – Apnea ventilation ON/OFF can be selected as start configuration. – Reduction of gas consumption by switch-off of control and flush flows after 3 minutes in standby mode. – Modified autoflow operation: After disconnection and detected tube obstruction, autoflow starts with a test stroke. – New mode called "BIPAPassist" – All alarms are entered in the log at the time of their occurrence. – Frequency "0" in BIPAP and SIMV – Status of apnea ventilation is displayed on setting side.

2 Software Change Report for Evita 2 dura

2.1 An Overview of Software Versions, Approval and Regions

The following table provides an overview of approved software versions for different regions.

- invalid:** This software version is approved, but should not be used because it no longer reflects the latest version. An updated version should be installed when the next repair work or inspection takes place.
- current:** This software is both approved and the most current version.
- approved:** This software is approved but not a current version. Conversion is only necessary if improvements are desired.
- not approved:** This software version is not approved in a country or region and is, thus, NOT to be used.

Software versions ¹⁾	All Regions except the USA and Japan	USA only	Japan only	Order No. of Conversion Kit ²⁾
2.03	invalid	not approved	not approved	-
2.04	invalid	not approved	not approved	-
2.05	invalid	not approved	not approved	-
3.00	approved	approved	approved	-
3.01	approved	approved	approved	-
3.02	approved	approved	approved	-
3.10	approved	approved	approved	84 14 287
3.21	approved	approved	approved	84 14 585
3.22	approved	approved	approved	84 14 493
4.0	current as of 01/2001	current as of 01/2001		84 14 468

- 1) Software Versions: are sorted according to publication dates. The Instructions for Use and Keypad strips vary for software versions 2.n and 3.n .
- 2) 2) Software conversion kit software: This kit contains everything necessary for updating and upgrading a unit's software: Download disk, options indicator stickers, Instructions for Use and, if required, keypad strips or other parts. After DrägerService has carried out the conversion, the download disk should be kept for future repair cases. As of Service Software Version 8.n, it will be possible to archive several download programs on service PCs .

2.2 Description of Software Changes for Evita 2 dura

Software version	Info
2.03/2.04	<p>Initial version for France (software version 2.03) and Italy (software version 2.04)</p> <p>Instructions for Use for software version 2.n</p> <p>Functionally identical with test devices 1996:</p> <ul style="list-style-type: none"> – only one language available – no download – no Service Mode – "Ventilation Plus" feature only partly implemented (only AutoFlow and APRV), but cannot be switched off. – "Monitoring Plus" feature only partly implemented (only measuring maneuvers, loops, log), but cannot be switched off. <p>The only optional feature available is the DC module.</p> <p>Only 30 units are equipped with this software version (France, Italy, Belgium, and Spain).</p> <p>As of February 97, these 30 units will be upgraded with software version 2.05 via BD32.</p>

Software version	Info
------------------	------

2.05	<p>International initial version Instructions for Use for software version 2.n</p> <ul style="list-style-type: none"> – Ventilation Plus feature is switched off (APRV, AutoFlow). – Monitoring Plus feature is switched off (measuring maneuvers, loops, and log). – Initial parameters and interface can be configured. – Set of curves can be toggled (+ volume curve) and configured. – Set of digital values can be toggled and configured. – Software download available – Internal Service Mode without log. – Language selection, German, English, French, Italian, and Spanish. – DC module can be switched on and off. – Device check via printed check list. – Without CO₂ and SpO₂ – Without expiration hold – Without context texts <p>The only option (software or hardware) available is the DC module.</p>
------	---

Software version	Info
3.00	<p>Based on software version 2.05 Instructions for Use for software version 3.n</p> <p>Improvements to software version 2.05: The following additional languages will be implemented as compared to the previous version 2.05:</p> <ul style="list-style-type: none"> – Japanese, US-English, Swedish, Dutch (Flemish) <p>Additional functions:</p> <ul style="list-style-type: none"> – External Service Mode via PC – "Ventilation Plus" option (APRV, ILV, AutoFlow) – "Monitoring Plus" option (measuring maneuvers, loops, and log) – "Service Plus" option – "Evita 4 Sat" option – "Evita 4 DC" option – "Evita 4 Link" option – "Capno Plus" option – Device check in standby

Software version	Info
3.01	<p>Based on software version 3.00 Instructions for Use for software version 3.n</p> <p>Important: This software version is not approved for the NeoFlow option in the Evita 2 dura.</p> <p>Important: New Evita 2 dura units shipped with software version 3.01 must not be provided with an earlier software version. These units have new flash EPROMS (AM29 F040B - 90 EC) on the Frontpanel PCB which can only be programmed using software version 3.01 or later.</p> <p>Improvements to software version 3.00:</p> <ul style="list-style-type: none"> – Unit check. During the leak test, the PEEP/PIP valve is set to 100 mbar (previously 60 mbar). Expiratory valves with minor crater damage now pass leak test as well. However, test pressure in tubing system remains 60 mbar. – Improved PEEP control for high-resistance tubing systems.
3.01	<ul style="list-style-type: none"> – An absent or defective standard flow sensor does not result in auto-triggering. – An absent or defective standard flow sensor does not result in a higher PEEP. – The airway pressure sensors are calibrated immediately after the self-test (previously after 3 minutes). – Error 02.71.001 no longer occurs between several aspiration modes if ventilation has not occurred in between. The 2-min aspiration time is too short for some users. – The "O2 measurement fault" alarm is suppressed for 1 minute after calibration of O2 measurement to enable hardware to attain a stable measurement status after calibration. Alarm was likely to occur after calibration if the voltage from the O2 sensor corresponded to an O2 concentration greater than 106 vol.%. This could happen if diaphragm Y3.3 is not centered. – The Gold-Cap test is performed every 20 hours (previously once an hour) to avoid the error message 02.71.003. – The flow and Tinsp settings are transferred correctly via Medibus, Lust and to the printer log (Tinsp to 2 decimal places). – Improvements to Dutch text "Enkele ademteng". – Text message handling in the lower blue text field has been improved.

Software version	<p>Info</p> <ul style="list-style-type: none"> – Additional unit fault messages for HPSV Air and HPSV O2 11.01.001 to 11.01.015 = HPSV Air, the final digits correspond to the status message. 12.01.001 through 12.01.015 = HPSV O2, the final digits correspond to the status message. – Improved starting behavior of Autoflow: If it is not possible to determine the necessary inspiratory pressure by applying a volume with minimum flow, a pressure of PEEP + 5 mbar is used in the first inspiratory stroke. During the next inspiration, a pressure corresponding to 75% of the calculated pressure is used. – Autoflow alarm situations resulting in termination of inspiration before volume is attained no longer cause an increase in the internal pressure set point. – The minimum sound volume setting has been increased. – Completion of an ASB breath is followed by the activation of a 500 ms (adult mode) or 150 ms (pediatric mode or Neo mode) trigger suppression time to prevent auto-triggering. – Error 02.71.018 is no longer displayed without cause.
3.01	<ul style="list-style-type: none"> – Changing CO2 measurement units does not result in loss of data. – The pressure P01 is displayed in the format x.x mbar. – The display Vtrap is correct. – The maximum permissible leak flow during the device check is indicated. – Rotation direction of control knob for reading out lists is reversed. – Reduced sensitivity of control knob.
3.02	<p>Based on software version 3.01 Instructions for Use for software version 3.n</p> <p>Important: This software version is not approved for the NeoFlow option in the Evita 2 dura.</p> <p>Improvements to software version 3.01:</p> <ul style="list-style-type: none"> – Calibration of exp. flow sensor in connection with suction mode has been implemented, – Apnea alarm in MMV mode occurs without delay. – Trigger times in MMV mode are the same as in SIMV mode. – Leakage compensation accuracy has been improved.

Software version	Info
3.10	<p>Based on software version 3.02 Instructions for Use for software version 3.n</p> <p>Improvements to software version 3.02:</p> <ul style="list-style-type: none"> – Additional languages: Portuguese, Russian, Arabic, Chinese, Greek. – Measurement maneuver PO.1 can be carried out in MMV mode. – Medibus protocol: PCO₂ curve corrected in mmHg. – Medibus protocol: Rounding error between displayed value and transmitted value corrected. – Automatic flow calibration in the nebulization phase if the measured MV is by 20% greater than the applied MV insp. This avoids the "Flow measurement fault" alarm. – The daily automatic flow calibration is performed only if the deviation between measured MV and applied MV insp. exceeds 10%. This increases the service life of the flow sensor. – NeoFlow option is possible as soon as Instructions for Use are available. – SpO₂ measurement is no longer possible in standby mode. – SpO₂ curve scaling corrected. – Device error "02.08.002" in the "Flow measurement ON/OFF" menu is avoided. – During apnea ventilation, the following settings are entered in the log: f_{Apnea}, VT_{Apnea} or P_{Apnea}, PEEP and FiO₂.
3.21	<p>Based on software version 3.10 Instructions for Use for software version 3.n</p> <p>Improvements to software version 3.10:</p> <ul style="list-style-type: none"> – Removal of malfunction during drug nebulization in pediatric and neonatal mode.
3.22	<p>Based on software version 3.21 Instructions for Use for software version 4.n</p> <p>Improvements to software version 3.21:</p> <ul style="list-style-type: none"> – New CO₂ carrier supported – HPSV valve actuation optimized

Software version	Info
4.0	<p>Based on software version 3.22 Instructions for Use for software version 4.n</p> <p>Improvements to software version 3.22:</p> <ul style="list-style-type: none"> – Selection of previous patient settings (including alarm limits) when switching the unit on again. (Trends are not kept) – Leakage compensation can be deactivated. – Humidifier options: active / HME (Heat and Moisture Exchanger) – Apnea ventilation ON/OFF can be selected as start configuration. – Reduction of gas consumption by switch-off of control and flush flows after 3 minutes in standby mode. – Modified autoflow operation: After disconnection and detected tube obstruction, autoflow starts with a test stroke. – New mode called "BIPAPassist" – All alarms are entered in the log at the time of their occurrence. – Use of "Additional modes" has been simplified.

3 Download

3.1 Test equipment

RS232 extension (9-pin Sub D socket on 9-pin Sub D connector; length = 3 m, with service coding) 79 01 808

RS232 adapter RxD and TxD transposed (9-pin Sub D socket on 9-pin Sub D connector; length = 0.15 m, with service coding) 79 01 888

Service PC with Windows 95, 98, or NT

- In future, new versions of the service software will not run under DOS or Windows 3.n. However, these restrictions do not apply to version 8.n yet.
- Windows 95/98 requires at least version 8.n of service software 79 01 831.
- If Windows NT is used, it is necessary to disable the screensaver, otherwise the software in the medical device could be damaged while downloading.
- If Windows NT is used, it is necessary to create a DOS partition on the PC (a second operating system). At present, this is only required for BD32.
- The service software for BD32 does not function on some IBM laptops.

Service Software

- For Windows 3.n, 95, 98, and NT

79 01 831

Downloadable operating software

see chapter 1 "Software Change Report for Evita 4", page 2 and see chapter 2 "Software Change Report for Evita 2 dura", page 12

3.2 Download description

- Connect the Evita and the PC to the mains power supply.



Caution:

The initial program loader (IPL) of the Evita might be damaged in the event of a power failure. **DO NOT** perform the download while operating the Evita and the PC from their battery supplies. The battery capacity of the Evita is not sufficient for the download procedure.

- Connect the PC and the Evita to the RS232 extension and the RS232 adapter.



Important:

Downloading cannot be done with a normal RS232 cable. Pin 1 and 9 must be connected with a 10 kOhm resistor for the CPU 68332 PCB to be able to recognize the SERVICE-Q signal. Use only the specified cable and adapter.

- Switch on the PC.
- Start the service program "Service".
- Select the "Download" program with the cursor.
- Press {Enter}.
- Select the "Download Program" program with the cursor.
- Press {Enter}.

Download program: Communication uses COM1: as default
To exit the program press {ESC}
USE "?" within the program for a short help
 {Enter} Run {ESC} Exit

- Press {Enter}.

DrägerService Download

Insert the original firmware disk in drive A: or B:
or if this software is on hard disk enter C: at the prompt.
Please enter the drive where the firmware is located (A, B, C):

- Insert the floppy disk containing the Evita program in drive A.
- Press {A}.
- Press {Enter}.
- Note: More versions than one are able to be saved in the sub-directories of the hard-disk as of service software version 8.n. In this case, only one level of sub-directories should be used.
Examples of saving:
 - Evita 2 dura, software version 3.00 ⇒ subdirectory "E2SW300"
 - or
 - Evita 4, software version 2.20 ⇒ subdirectory "E4SW220".If the software has been saved, it can be called up via the hard disk "C".

Checking files on drive A:

ok

Starting download for

Device: Evita 4

Version: N.MM Date DD.MM.JJ

Disk: 1 of 1

Drive: A:

Do you want to continue? (Y/N)

- Press {Y}.
- Press {Enter}.

Do you want to copy the files to your hard disk?

All files in the temporary directory on your
hard disk will be erased!

Copy now? (Y/N)

Copy the program to the hard disk.

- Press {Y}.
- Press {Enter}.

Please select the serial port

1 = COM1
2 = COM2
3 = COM3
4 = COM4

Type 1, 2, 3, or 4.

- Type, for example, "2" to select COM2 and press {Enter} (You can also use COM1 → Connect the cable to this port. However, COM1 is usually used to connect a modem).

The download software is initialized.

Synchronize to COM?: 9600, 8, N, 1

- Switch on the Evita. The Evita does not start with its operating system.

Connected with "Evita 4" or "Evita 4 / Evita 2 dura".

This message will not appear if you have chosen the wrong COM port. Press {ESC} and choose the correct COM port. If the message "Connected with Evita" still does not appear, check the RS232 cable.

- Enter "downloadrequest" on your PC (you can also select "downloadrequest" with the arrow-up and arrow-down keys).
- Press {Enter}.

<Press {Enter}> to accept the previous value; <press {ESC}> to cancel.

- Press {Enter}.

Download files for version: XX

Selected	ID number	Description
-(X)-	XA	XN. DLD Software CPU PCB
(X)	XB	XM. DLD Software DISP PCB
(X)	XC	XO . DLD Software PNEU PCB
(X)	XD	XP . DLD Software COM PCB

Software downloads can be carried out individually or all at once. There is one download each for the CPU 68332 PCB, the Display PCB, the Pneumatics Controller PCB, and the Communication PCB (optional). A download file has been selected if an "X" appears under "selected". If, for example, you want to carry out a download for the Display PCB, you have to ensure that the software version marked on the floppy disk and the software version of the remaining printed circuit boards match (compare the marking on the floppy disk with the version displayed on the Evita after switching the ventilator on). If the software versions do not match, you must carry out a complete download.

- Press {Enter}.

Download procedure starts. Download information is displayed on the PC. The whole download procedure will take about 30 minutes. The download procedure is finished as soon as the following message appears on the PC screen:

Transfer of all files completed.

- Switch off the Evita.
- Remove the connection between the PC and the Evita.
- Switch on the Evita.

The Evita starts will start with its operating system. No device error messages should be displayed. If software 1.n is upgraded to 2.n and the unit is Evita 4, the warning "Loss of data" may appear. This warning should disappear after a few minutes and should not re-appear when the unit is switched on again.

Device functions and activation of optional features is not influenced by the download procedure. Device functions and activated optional features are stored in an EEPROM located on the CPU 68332 PCB.

A power failure during the download procedure could possibly damage the initial program loader (IPL) on the respective printed circuit board. Downloading must then be carried out via the BD32 interface.

4 Loading the Software via BD32

Downloading software via BD32 is only necessary if the initial program loaders on the boards were destroyed by a power failure while downloading the software.

Read and observe the following message before opening the machine:



Caution:

Electrostatic discharge may damage the electronic components. When handling electrostatic sensitive devices use static-dissipative mat and a wrist strap.

4.1 Test Equipment for BD32

Service PC with Windows 95, 98, or NT

- In future, new versions of the service software will not run under DOS or Windows 3.n. However, these restrictions do not apply to version 8.n yet.
- Windows 95/98 requires at least version 8.n of the service software.
- If Windows NT is used, it is necessary to disable the screensaver, otherwise the software in the medical device could be damaged while downloading.
- If Windows NT is used, it is necessary to create a DOS partition on the PC (a second operating system). At present, this is only required for BD32.
- The service software for BD32 does not function on some IBM laptops.

Service Software

- For Windows 3.n, 95, 98, or NT.

79 01 831

Service program with BD32 and
BD32-compatible operating software for Evita 4 / 2 dura 79 10 397
Version 1.0 only for Evita 4
Version 2.0: for Evita 4 and Evita 2 dura
Version 3.0: as of April 98, see Service Bulletin No. 3
Evita 2 dura
Version 4.0: new debug adapter
Version 5.0: adapted to new Frontpanel PCB

Debug adapter, old (with reset button) 79 01 980-00
Debug adapter, new (without reset button) 79 01 980

Cable, reset adapter, Evita 4 79 01 995

RS232 extension with service coding or 79 01 808
RS232 adapter with service coding 79 01 888

Software conversion kit [see chapter 1 "Software Change Report for Evita 4", page 2 and see chapter 2 "Software Change Report for Evita 2 dura", page 12](#)

The old version of the debug adapters 7901980—00 creates problems when used on fast laptops (Pentium II > 300 MHz). The new version of the debug adapter (which solves these problems) is available under part number 7901980. The new adapter has no reset button. But it has a red LED which indicates the status of the reset line and a green LED which indicates communication activities.

4.2 Installing and Using BD32



Important:

Windows NT computers must be booted under DOS. On Windows 95, 98, or 3.n computers the program runs only under DOS.

When installing the BD32 software using the "install" command, you must specify the parallel port and the processor type. If problems should occur during communication between the BD32 program and the processors on the printed circuit boards of the Evita 4, increase the set value of the port delay. To do so, type "Port LPTx delay value" in the BD32 program.

Examples of delay values:

386 processor = 0

486 processor = 10

Pentium processor = 200

Pentium II processor = 300

To quit the BD32 program, type "quit".



IMPORTANT:

The software has only been loaded if the message "BDFLASH completed without errors" appears. If the program is aborted before this message is displayed, the port speed should be set in the BD32 program using the "port lptx (delay value)" option.



Caution:

Always download the current software version afterwards.

4.3 Loading the Software to the Graphics Controller PCB/ Frontpanel PCB

With Evita 2 dura units, read Service Bulletin No. 3.

- Switch off the Evita.
- Open the Evita (see "[Opening the Evita 4/ Evita 2 dura](#)").
- Open the control unit (see "[Opening the Control Unit Evita 4/Opening the Front Panel Evita 2 dura](#)").
- Evita 4 only: Remove the Graphics Controller PCB from the control unit.
- Evita 4 only: Place the functional Graphics Controller PCB on an ESD protection mat.
- To silence the alarm, remove the CO₂ Carrier PCB from the Evita.
- Plug a jumper between pin 3 and pin 5 of connector X3 on the CPU 68332 PCB. You can use a jumper from the CPU 68332 PCB, e.g. from X5, X6, or X7.
- Connect the control unit with the Evita.
- Connect the debug adapter to the PC (parallel port) with the connector X10 (pin 1 on pin 1) of the Graphics Controller PCB / Frontpanel PCB.



Caution:

Do not plug the debug adapter onto the reset adapter.

- Connect the RS232 cable with service coding to COM1 on the CPU 68332 PCB (enabling of the programming voltage).
- Switch on the PC.
- Switch on the Evita.
- Start the "BD32" service program.
- 7901980 new: Enter "Reset".
- 7901980 new: Press "Enter".
- Type "Stop".
- 7901980 old: Press and hold the reset key in the debug adapter.
- Press "Enter".
- 7901980 old: Release the "Reset" key on the debug adapter.
- The bottom left display on your PC changes from "MCU running" to "MCU stopped".
- Evita 4: Type "do dispepr" on your PC.
- Evita 2 dura: Type "do frontepr" on your PC.

- Press "Enter".

End of data transmission will be indicated after approx. 10 minutes, depending on the set port speed. As soon as data transmission is completed, proceed as follows:



Caution:

Always download the current software version afterwards.

- Switch off the Evita.
- Leave the PC on.
- Re-place the jumper in its original position.
- Reassemble the Evita ready for use.
- Carry out safety and function tests according to Test Certificate.

4.4 Loading the Software to the Pneumatics Controller PCB

- Switch off the Evita.
- Open the Evita (see "[Opening the Evita 4/ Evita 2 dura](#)").
- Remove the cable harness connector from the electronics to the Pneumatics Motherboard PCB.
- Connect the cable reset adapter between the electronics and the Pneumatics Motherboard PCB.
- Plug the debug adapter to the connector X2 of the Pneumatics Controller PCB (pin 1 on 1).



Caution:

Do not plug the debug adapter onto the reset adapter.

- To silence the alarm, remove the CO₂ Carrier PCB from the Evita.
- Connect the RS232 cable with service coding to COM1 on the CPU 68332 PCB (enabling of the programming voltage).
- Switch on the PC.
- Switch on the Evita.
- Start the "BD32" service program.
- 7901980 new: Enter "Reset".
- 7901980 new: Press "Enter".
- Type "Stop".
- 7901980 old: Press and hold the reset key in the debug adapter.
- Press "Enter".
- 7901980 old: Release the reset key in the debug adapter.
- The bottom left display on your PC changes from "MCU running" to "MCU stopped".
- Type "do pneuepr" on your PC.
- Press "Enter".

End of data transmission will be indicated after approx. 10 minutes, depending on the set port speed. As soon as data transmission is completed, proceed as follows:



Caution:

Always download the current software version afterwards.

- Switch off the Evita.
- Leave the PC on.
- If you want to download the software to the CPU 68332 PCB, DO NOT remove the cable reset adapter between the electronics and the Pneumatics Motherboard PCB.
- Reassemble the Evita ready for use.
- Carry out safety and function tests according to Test Certificate.

4.5 Loading the Software to the CPU 68332 PCB

- Switch off the Evita.
- Open the Evita (see "[Opening the Evita 4/ Evita 2 dura](#)").
- Remove the cable harness connector from the electronics to the Pneumatics Motherboard PCB.
- Connect the cable reset adapter between the electronics and the Pneumatics Motherboard PCB.
- Plug the debug adapter to the connector X3 (pin 1 on 1) of the CPU 68332 PCB.



Caution:

Do not plug the debug adapter onto the reset adapter.

- To silence the alarm, remove the CO₂ Carrier PCB from the Evita.
- Connect the RS232 cable with service coding to COM1 on the CPU 68332 PCB (enabling of the programming voltage).
- Switch on the PC.
- Switch on the Evita.
- Start the "BD32" service program.
- 7901980 new: Enter "Reset".
- 7901980 new: Press "Enter".
- Type "Stop".
- 7901980 old: Press and hold the reset key in the debug adapter.
- Press "Enter".
- 7901980 old: Release the reset key in the debug adapter.
- The bottom left display on your PC changes from "MCU running" to "MCU stopped".
- Type "do cpuepr" on your PC.
- Press "Enter".

End of data transmission will be indicated after approx. 10 minutes, depending on the set port speed. As soon as data transmission is completed, proceed as follows:



Caution:

Always download the current software version afterwards.

- Switch off the Evita.
- Remove the connection between the PC and the Evita.
- Reassemble the Evita ready for use.
- Carry out safety and function tests according to Test Certificate.

4.6 Downloading Software to Communication PCB

- Switch off the Evita.
- Open the Evita (see "[Opening the Evita 4/ Evita 2 dura](#)").
- To silence the alarm, remove the CO₂ Carrier PCB from the Evita.
- Plug a jumper between pin 3 and pin 5 of connector X3 on the CPU 68332 PCB. You can use a jumper from the CPU 68332 PCB, e.g. from X5, X6, or X7.
- Connect the debug adapter to the PC (parallel port) with the connector X10 (pin 1 on pin1) of the Communication PCB.
- Connect the RS232 cable with service coding to COM1 on the CPU 68332 PCB (enabling of the programming voltage).
- Switch on the PC.
- Switch on the Evita.
- Start the "BD32" service program.
- 7901980 new: Enter "Reset".
- 7901980 new: Press "Enter".
- Type "Stop".
- 7901980 old: Press and hold the "Reset" key on the debug adapter.
- Press "Enter".
- 7901980 old: Release the "Reset" key on the debug adapter.
- The bottom left display on your PC changes from "MCU running" to "MCU stopped".
- Enter "do commepr" on your PC.
- Press "Enter".

End of data transmission will be indicated after approx. 10 minutes, depending on the set port speed. As soon as data transmission is completed, proceed as follows:



Caution:

Always download the current software version afterwards.

- Switch off the Evita.
- Remove the connection between the PC and the Evita.
- Reassemble the Evita ready for use.
- Carry out safety and function tests according to Test Certificate.